

California **GARDEN**

SEPTEMBER-OCTOBER 1988

One Dollar

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CALLAS



Illustration and story by Robert D. Horwitz

The calla, sometimes referred to as the Easter Lily and formally known as *zantedeschia*, is a native of South Africa. It grows in Southern California regions as if this were its native habitat. In some areas along the coast, the foliage stays green all year round and flowering is early summer. The ones that bloom at Easter have probably been forced under green house conditions. The various varieties exhibit leaves that are basically heart-shaped although they may be long and narrow or roundish. Some leaves are variegated, but most of them enjoy a full pleasant green color. The leaf stems are fleshy and of a lighter green, emanating from the basal clumps supported by the rhizome and root system. As the older leaves mature, turn yellow, and die off, new leaf growth occurs from the middle of the clump.

Blossoms are formed with a velvety collar-like bract which surrounds the central flower spike containing many closely spaced small true flowers. The bract in the most common form is the lily-white color so familiar to us. Soft pastels are available in red, pink, yellow, and even spotted varieties. The flowers are long lasting, showing off for over a month on the plant, and several weeks if cut and displayed in a vase with water changes occasionally. If fertilization takes place in the flower,

seeds will form at the base of the spike and eventually bulge out from the bract. When fully ripe, they are easy to sow for new plants. It will take a year or more for seedlings to mature enough to establish rhizomes that will support blossoms.

The calla grows happily in pots or in the open garden. They may reach up to four feet in height and have flowers as big as four inches across. Culture is simple. Almost any soil that will accept water and nutrients will suffice. Fertilize in early spring with a balanced fertilizer to assure good growth and flower production. Repeat every two weeks during the blooming period, stopping when the plant wants to go dormant.

When pot-bound, the rhizomes can be separated and re-potted in fresh soil and additional pots. Water in the summer frequently, as the large leaves transpire a lot of moisture into the air. Pests are few, snails being the most prevalent. Remove yellowing leaves to maintain the appearance of the plant. After blooming is complete, reduce watering significantly so that the calla can complete its growth cycle before it starts to put out new leaves to start the cycle again.

Bob Horwitz is a retired aerospace engineer with a big garden.

Love Stamp Issuance In Pasadena Celebrates Centennial Of Tournament of Roses Parade

A lovely pink rose to express the message of love on this year's special stamp was issued on July 4, 1988, in Pasadena, California. The official dedication was conducted in conjunction with the Independence Day celebration planned at the Rose Bowl. The design was prepared by Richard D. Sheaff, of Needham Heights, Massachusetts, from a photograph.

It previously was unveiled during the New Year's Eve celebration in Washington, D.C., to signal the beginning of 1988, and also was featured later in the day at the Tournament of Roses Parade in Pasadena, as a salute to the centennial of that annual pageant.

The word "LOVE" appears below the single rose bloom in white lettering "dropped-out" from the leafy, dark green background, and "USA" appears in the top left corner, with "25" in the upper right.

The Love stamp, first available on a regular basis in 1982, has proven to be an enormously popular choice for customers' valentines, wedding invitations and other correspondence to friends and family. In recent years, almost a billion Love stamps have been printed annually to meet customer demand.

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PUBLICATION STAFF

EDITOR

Elizabeth B. Glover

EDITOR EMERITUS

Allethe Macdonald

ASSOCIATE EDITOR

Dr. Donald Boyer

Grace Boyer

Skipper Cope

Bill Gunther

Barbara Jones

Jo Westheim

PRODUCTION EDITOR

Pat Ziebarth

CONSULTANTS

Dr. Geoffrey Levin

Dr. William Nelson

Dr. Donald P. Watson

STAFF WRITERS

Penny Bunker

Mary Lou Orphey

Harry Tolen

Alison Voss

Tineke Wilders

COORDINATORS

Advertising — Jo Ann Gould

Circulation — Roy Jones

SALES REP

Dr. Donald Boyer 442-4242

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COVER

LOVE STAMP ISSUED JULY 4, 1988 BY THE UNITED STATES POST OFFICE

California Garden, a non-profit magazine published by the San Diego Floral Association, Incorporated, has provided information and much inspiration to plant enthusiasts around the world since 1909. It reaches readers in Canada, Bulgaria, Mexico, Israel, Soviet Union, Sweden, Venezuela, plus Western Australia. In addition, it is sent to many of the States, plus a large number of readers in California. It is considered the oldest, continually published horticultural magazine in the United States and received worldwide recognition as an authoritative, horticultural magazine, written and edited by experts. Published bi-monthly (6 issues per year), it contains interesting, informative articles, a listing of garden clubs with time and place of meeting, a horticulture calendar of events, book reviews, and features "Now is the Time" which tells when to water, prune, transplant and fertilize many types of plants.

San Diego Floral Association provides three different methods to advertise in CALIFORNIA GARDEN magazine:

For \$25.00 a year, a professional horticultural business could be listed under the PROFESSIONAL AFFILIATES column each issue with name of business, address and telephone number.

A Classified advertisement, preferably concerning horticultural items, may be placed at \$2.00 per line for one issue only, or \$1.50 per line in more than one issue. There is a minimum of two lines.

A regular advertisement may be placed at the following rates. This is to be camera ready — ready for paste-up.

The deadline for ads to be placed, or discontinued in the next issue, is 15 Jan., Mar., May, July, Sept., or Nov. Unless you specify which issues you want your ad in, we will continue it until notified otherwise by you.

You would automatically receive a copy of CALIFORNIA GARDEN if your ad is in it. We would welcome your advertisement.

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HORTICULTURE CALENDAR

**San Diego Floral Association Event*

***FREE FLORAL CRAFTS INSTRUCTION WORKSHOP** Each Thursday 10-3 p.m. in San Diego Floral Library, Room 105, Casa del Prado, Balboa Park. Closed for the summer. Will commence again in September. They need seed pods and pine cones for the Christmas wreaths and trees. If you are creative and wish to participate, come each Thursday to Floral Office. Info: 232-5762.

OFFSHOOTOURS SPONSORS FREE one hour walking tour in Balboa Park every Saturday. Meet at 10 a.m. in front of Botanical Building at the lily pond. Topics include: 1st week, the heart of the park; 2nd week, palm walk; 3rd week, tree walk; 4th week, desert walk; If a 5th week, repeat 1st week's tour. Call 297-0289 for reservations.

OFFSHOOTOURS SPONSORS FREE two-hour walking tour of San Diego Zoo, focusing on the botanical side. Call (619) 297-0289 in advance for reservations. 9:30 a.m.

***August 20**

Afternoon English Tea and Fashion Show held by San Diego Floral Association from 2-4:30 p.m. Casa del Prado Courtyard, Balboa Park. Proceeds will go toward the Ethel Hoyt Scholarship Fund. There will be a drawing for 2 round trip airline tickets from San Diego to London, England donated by American Airlines, two \$50.00 Gift Certificates courtesy of Fun & Fancy Fashions, Point Loma, and a round trip for 2 to Catalina Island courtesy of Fleetridge Travel. There will be booths, exhibits and other drawings, plus a fashion show. Info: 232-5762. Donation: \$10.00.

August 20, 21

Dahlia Show sponsored by the South Coast Dahlia Society, South Coast Botanic Garden, Palos Verdes Peninsula. Sat: 12-5 p.m.; Sun: 9-4 p.m.

August 20, 21

San Diego Fern Society's 10th Show and Sale, Room 101, Casa del Prado, Balboa Park. Sat: 1-5 p.m.; Sun: 10-5 p.m. Free.

August 20, 21

Cactus and Succulent Show sponsored by the Cactus and Succulent Societies from Los Angeles, Long Beach, and the San Gabriel Valley, featuring over 1500 entries and displays. Cacti, succulents, pots, and potting soil for sale. Los Angeles State and County Arboretum, Arcadia, 9-4:30 p.m.

August 21

Concert Under the Oaks at Quail Botanical Gardens including ten renditions of well known and loved classical tunes, alternating instrumental with vocals, a soprano and a baritone. It starts at 7 p.m., but be there no later than 6:30 p.m. Bring a blanket to sit on. A few chairs will be available. Admission \$3 per person. 230 Quail Gardens Drive, Encinitas. Info: 436-3036.

August 26-28

San Francisco County Fair Flower Show at San Francisco County Fair Building, 9th Avenue &

Lincoln Way, Golden Gate Park, San Francisco. 10-6 p.m. Admission \$3 General; \$2 Seniors; Children under 12 free. Info: (415) 558-7962.

August 26 - September 22

Artist of the Month, Colorists Diane Bensler and Gary Wong will present "Concert in Color" at Descanso Gardens, La Canada Flintridge. Sponsored by Descanso Gardens Guild. 9-3:30 p.m.

August 27, 28

San Diego Turtle and Tortoise Society's 14th Show, Casa del Prado, Room 101, Balboa Park. 10-5 p.m. Free.

September 3, 4

San Diego Professional Horticulturists 5th Show, Casa del Prado, Room 101, Balboa Park. Sat: 10-5 p.m.; Sun: 10-4:30 p.m. Free.

September 3-5

Fern Show sponsored by the Los Angeles International Fern Society, in Ayres Hall, Los Angeles State and County Arboretum, Arcadia. Demonstrations at 11 a.m., 1, and 3 p.m. More than 1,000 ferns and other plants for sale 9-4:30 p.m.

September 7

Annual Docent Training Classes at Quail Botanical Gardens start with meetings every Wednesday in Ecke Bldg. from 9:30 to noon, for ten consecutive weeks. Docents learn basic botany, taxonomy, plant identification, plant propagation techniques, how to give a tour of the gardens, and much more. After graduation, docents are expected to donate 8 hours a month to the gardens in any way they choose. Classes limited to 25. If interested, call Mona Kennedy at 729-2982 to pre-register.

September 11

Planting Winter Vegetables Now. Sid Horton will discuss planting techniques for winter vegetable gardens. Vegetables, such as cabbage and broccoli, will be featured, as well as uses for home grown herbs. South Coast Botanic Garden, Palos Verdes Peninsula. 2 p.m.

September 14-18,

American Begonia Society Convention 88 hosted by the Buxton Branch at the Burlington Marriott with the theme "Begonias in Boston, 50 Golden Years". Info: Corliss Engle, 26 Edgehill Road, Brookline, MA. 02146. (617) 232-2033.

September 17, 18

San Diego Bromeliad Society's 14th Show, Casa del Prado, Room 101, Balboa Park. Sat: 1-4:30 p.m.; Sun: 11-4:30 p.m. Free.

September 18

Gardens of Southern England. Don Walker will show slides of gardens in England that will work in southern California. South Coast Botanic Garden, Palos Verdes Peninsula. 2 p.m.

September 23-October 20

Artist of the Month. Bruce Spicer's fourth one-man show featuring watercolors with hand-made rice paper collages. Western landscapes, California

seashore, and pueblos of New Mexico and Arizona. Descanso Gardens, La Canada Flintridge, 9 a.m.-3:30 p.m.

September 24, 25

Bonsai Show by the Akebono Bonsai Society at the Los Angeles State and County Arboretum, Arcadia 9-4:30 p.m. Demonstrations at 2 p.m. each day. Sale features plants, tools and books.

September 24, 25

San Diego Bonsai Club Fall Show, Casa del Prado, Room 101, Balboa Park, 10-5 p.m. Free.

September 25

Late Summer and Fall care of Roses by Dr. Thomas Carnes at South Coast Botanic Garden, Palos Verdes Peninsula, 2 p.m. Soil preparation, planting, pruning, and how to extend blooming season of roses through fall will be discussed. Visitors can do some hands-on pruning. Miniature roses and pruning saws for sale.

***September 28**

Basket Weaving Class, sponsored by San Diego Floral Association, Casa del Prado, Balboa Park. Call Marie Walsh at 298-5182 for reservations and information. Classes are limited. Fee.

October 1, 2

Art and Photography Show at Quail Gardens, 230 Quail Gardens Drive, Encinitas, CA 10 a.m.-4 p.m. Featuring paintings and photographs that have originated from the Gardens. Awards will be given for painting, black and white photography, and color photography. Call 944-4413 or 436-3070 for details, or pick up an instruction sheet from the Quail Gardens Gift Shop/Nursery. Every hour on the hour, between 10 and 3 p.m., free guided tours will be given by docents. Art, plants, lemonade and popcorn will be on sale. Free admission. Parking fee \$1.00.

October 1, 2

Balboa Park African Violet Society's Fall Show at Casa del Prado, Balboa Park, Room 101. 10-4 p.m. Free.

October 2

Flower Magic. Photographer Erma Rudd will show slides of flower photography and development of techniques, and will also discuss lighting and background of both domestic and wildflowers. South Coast Botanic Garden, Palos Verdes peninsula. 2 p.m.

October 4-30

Offtrack Gallery will present a showing of handmade paper collages entitled "Symbols: Variations on a Theme" by Lorraine Gibb during the month of October. The gallery is open from 10 a.m. to 5:00 p.m. Tuesday through Sunday at 510 North Highway 101, Encinitas in the old train station. Info: 942-3636.

***October 5, 12, 19**

American Contemporary Flower Arranging Classes by Adrienne Green sponsored by San Diego Floral Association at Casa del Prado, Balboa Park. Call Marie Walsh 298-5182 for reservations. Classes limited. Three all day classes \$25.

October 8

Fourth Annual Ecological Landscaping Symposium

for Southern California Homeowners, sponsored by Rancho Santa Ana Botanic Garden from 8:30-4:30 p.m. The theme is "The Edible Landscape". Speakers include Rosalind Creasy, Ray Walsh, Shirley Kerins, Ken Kido, Richard Veyna, Bill Nelson, and Tom Spellman. Books, displays, and exhibits of plant materials will be available. Registration fee: \$35.00. Catered lunch available for additional fee. Info: RSABG Education Dept., 1500 No. College Ave., Claremont, CA 91711, or call (714) 626-1917.

October 8, 9

North (San Diego) County Rose Society's 22nd Annual Rose Show at Plaza Camino Real, Carlsbad. Sat: 1-6 p.m.; Sun: 12-4 p.m. Free.

October 8, 9

Descanso Plant Sale sponsored by Descanso Gardens Guild. Old fashioned roses, camellias, azaleas, and a variety of perennials for sale at bargain prices. Fruit, flowering and shade trees, and herbs can be found. 9-4:30 p.m. at Descanso Gardens, La Canada Flintridge.

October 8, 9

South Bay Orchid Society's Orchid Show at South Coast Botanic Garden, Palos Verdes Peninsula, Sat: noon-4:30 p.m.; Sun: 10-4:30 p.m. Display of more than 2,000 orchids native to Africa, Australia, New Zealand and Japan. Videos and repotting demonstrations.

October 11-14

Ikebana International's 11th North American, San Diego Chapter #119, Regional Conference at the U.S. Grant Hotel, San Diego. Tickets still available for:

Oct. 10 - Opening Banquet, 7 p.m. \$50.

Oct. 12 - Demonstration by Kobai Naruse, Headmistress Chiko School, 2-4 p.m. \$25.

Oct. 13 Demonstration by Houn Ohara, Headmaster, Ohara School. 1:30-3:30 p.m. \$25.

Oct. 13 Dinner cruise on San Diego Bay, 6:30 p.m. \$35.

Oct. 14 Sayonara Banquet including Kabuki performance 7 p.m. \$65.

For tickets, call (619) 222-7282, or 270-5795, or write to Mrs. Joanne Meredith, General Chairman, 5343 Soledad Mountain Road, San Diego, CA 92109, or Ikebana International, 639 Silvergate Avenue, San Diego, CA 92106.

October 14-23

Eighth Annual Los Angeles Garden Show "Gardens for All Seasons" at the Los Angeles State and County Arboretum, Arcadia. 10-6 p.m. Emphasis will be on growing possibilities in the Mediterranean climate of southern California. 3 acres will feature indoor and outdoor landscapes filled with plants and flowers representing various seasons. Trade Mart will have plants, gardening paraphernalia, and outdoor furnishings for sale. Admission \$5 for adults, \$3 for Seniors and ages 5 through 17. Parking free.

October 15, 16

25th Anniversary Show of Los Angeles Rose Society featuring more than 1,000 types of roses, plus new hybrids. Rosarians will answer questions and

literature will be available. Miniature rose plants for sale. Descanso Gardens, La Canada Flintridge. Sat: noon-4 p.m.; Sun: 9-4:30 p.m.

October 16

Gudrun Kimmel will present "Dried Arrangements Need Not Be Brown". He will demonstrate how to dry easy to find flowers and plants. Floral spray paint and a variety of dried material will be used in pottery and baskets for wall and table arrangements. South Coast Botanic Garden, Palos Verdes Peninsula, 2 p.m.

*October 18

San Diego Floral Association's Meeting at Casa del Prado, Room 101, Balboa Park, at 10 a.m. Salad Potluck. Call (619) 232-5762 for reservations for lunch. Reservations not required for meeting at 10.

October 22, 23

San Diego County Orchid Society's Fall "Mini" Show at Casa del Prado, Room 101, Balboa Park, San Diego. Sat: noon-5 p.m.; Sun: 10-4:30 p.m. Free.

October 22, 23

Lake Hodges Native Plant Sale at Ralphs Shopping Center Parking Lot, Pomerado Road and Bernardo Heights Parkway, Rancho Bernardo. Sat: 9-4 p.m.; Sun: 9-1 p.m. all kinds of plants for sale, many natives, mostly drought resistant, very reasonably priced. Info: Mrs. Dorris Baur, 487-6614.

October 22, 23

South Coast Bonsai Association's Annual Bonsai Exhibit and Sale. Grasses and herbs, along with common deciduous and evergreen trees, will be presented in classic bonsai shapes. Demonstrations at 11 a.m. and 2 p.m. South Coast Botanic Garden, Palos Verdes Peninsula. 9-5 p.m.

*October 26

Basket Weaving Class at Casa del Prado, Balboa Park. Call Marie Walsh 298-5182 for reservations and information. Classes are limited.

October 26-30

Country Cottage Crafts at South Coast Botanic Garden, Palos Verdes Peninsula 9:30-4:30 p.m. More than 100 craftspeople and artists will sell handmade crafts. Personalized gifts and holiday decorations can be purchased.

October 29, 30

56th Annual Chrysanthemum Show by the Glendale Chrysanthemum Society featuring more than 3,000 blooms. Printed material on chrysanthemum care and growth will be available, and pots of flowering plants will be sold Descanso Gardens, La Canada Flintridge, 9-4:30 p.m.

*November 2, 9, 16

American Contemporary Flower Arranging Classes by Martha Rosenberg sponsored by San Diego Floral Association in Casa del Prado, Balboa Park. Call Marie Walsh, 298-5182 for reservations. Three all day lessons \$25.

November 5

Annual Native Plant Sale at Rancho Santa Ana Botanic Garden, 1500 North College Avenue, Claremont, CA 8-2 p.m. Specimen trees, shrubs, succulents, groundcovers, native California grasses, dudleyas, fremontias, manzanita, ceanothus, iris, sage, woolly blue curls, books, posters, gift items, and refreshments will be for sale. Experts will give advice on selection, planting and maintenance of plants on sale. Info: (714) 625-8767.

November 5, 6

San Diego Tropical Fish Society's 18th Annual Show at Casa del Prado, Room 101, Balboa Park. Sat: noon-6 p.m.; Sun: 9-4:30 p.m. Free.

November 20

Sumi-e Painting and Ikebana's 13th Annual Show at Casa del Prado, Room 101, Balboa Park. 11-4 p.m. Free.

*December 2, 3, 4

San Diego Floral Association's Annual Christmas Show at Christmas on the Prado, Balboa Park. Fri: 5-9 p.m.; Sat: 11-9 p.m.; Sun: 11-4 p.m. Free.

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The Calimyrna Fig and it's Wasp

Branch of caprifig in early summer with mature profichi syconia. They resemble edible figs — except they are filled with wasps and pollen-bearing stamens. They are native to Asia Minor and are grown in California for pollination (caprification) of Calimyrna figs.



Story and photographs by
W.P. Armstrong

Each June in California's hot San Joaquin Valley, a most remarkable biological phenomenon takes place. Traveling north of Fresno on Highway 99, thousands of acres of Calimyrna fig orchards are "decorated" with small brown or white paper bags. This unusual annual event results in the delicious nutty flavor of Calimyrna figs, and the crunch in your fig newtons.

To fig connoisseurs, Calimyrnas are the ne plus ultra of figs. Comparing them with other cultivated varieties is like comparing red snapper with swordfish, or hamburger with filet mignon! If you don't particularly like figs, you probably have never tasted a fresh Calimyrna. Since they are extremely perishable, most of the Calimyrna crop is used for dried figs, confectionaries, and pastries.

In a strict botanical sense fig "fruits" are actually inside cut flower clusters (inflorescences) called syconia. They are hollow, fleshy structures composed of modified stem (peduncular) tissue, lined on the inside with hundreds of minute flowers. At one end is a small opening (ostiole) lined with

dense, overlapping scales. Calimyrna syconia contain only female flowers, and must be pollinated in order to ripen. Each tiny flower consists of a five-parted calyx, and an ovary with a long style. Following pollination and fertilization, the ovaries develop into minute one-seeded drupelets with a hard inner layer (endocarp) surrounding the seed. The seed-bearing drupelets produce the superior nutty flavor and crunch. Without pollination Calimyrna syconia fail to ripen, and drop from the branches.

Up until the late 1800s, Calimyrna growers in California were puzzled as to why their trees would not set fruit. It was finally discovered that they needed a tiny female wasp pollinator from Asia Minor (*Blastophaga psenes*) that lives inside the fruits of pollen-bearing wild figs (called caprifigs). Capri refers to goat, and the inedible wild figs were apparently fed to livestock. The tiny wasps are only two millimeters long, small enough to pass through the "eye" of a sewing needle. Wasp-bearing caprifigs are now grown in California, and each summer they are placed in the little

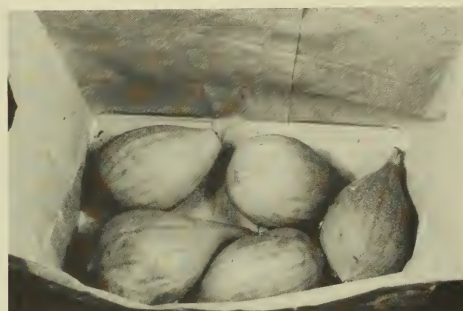
brown bags in Calimyrna orchards. This process, called caprification, is vital to the Calimyrna growers.

By June the fig wasps living inside caprification syconia are mature. At this time the male flowers inside are shedding copious pollen, and the ostiolar scales are loose and passable. The gravid female fig wasp (already inseminated by a male) becomes dusted with pollen as she crawls out of the caprification syconium. She flies to a Calimyrna branch where she instinctively forces her way through the ostiole of a receptive syconium. As she squeezes through the pore, her wings often break off, and protrude from the opening. In fact, this is how you can tell if a wasp has entered the unripe Calimyrna. Only in small receptive syconia can the female wasp enter the ostiole, and push through the inner layer of closely overlapping scales. After this stage the ostiole is virtually impervious to insect entry. Inside she attempts to lay an egg inside the ovary of each female flower by inserting her ovipositor (egg-laying device) down the slender style. In Calimyrna figs this turns out to be a lesson in futility because the styles are all too long (much longer than her ovipositor). She withdraws her ovipositor and moves from one flower to another. In her desperate attempt to lay eggs she inadvertently pollinates the flowers. Eventually she dies from sheer exhaustion, or old age, and is broken down by a protein-digesting enzyme (ficin) inside the fig. (In French Polynesia the ficin-rich sap from a native banyan fig is used to kill parasitic worms, and to treat skin cancer.)

Female wasps, lucky enough to live in a grove of wild caprifigs, will be able to carry out their instinctive tasks. She can easily lay eggs inside the short-style flowers of caprifigs, and



Each June, paper bags containing wasp & pollen-bearing caprifigs are stapled to limbs in Calimyrna orchards.



Paper bag containing wasp & pollen-bearing caprifigs. Several tiny, black female wasps have emerged from the syconia.



Left to right: A profichi caprifig syconium cut open showing mass of stamens protruding from region just below ostiolar scales.; (center) The overwintering mamme crop of syconia on deciduous branches of caprifig houses fig wasps during cold winter months; (right) Close-up view inside Calimyrna fig showing dense thicket of female flowers. It is virtually impossible for female wasp to deposit her eggs inside the ovaries — her ovipositor is too short to penetrate the long, threadlike styles.

perpetuate her offspring. Some of these may end up in Calimyrna groves the following summer. Lucky for us she can't lay eggs in Calimyrna figs -otherwise we might have a mouthful of fig wasps.

Most authors refer to the short-style female flowers inside the syconia of caprifigs as "gall flowers," presumably because they are commonly occupied by a developing fig wasp; however, they are fully capable of producing normal seed-bearing drupelets, and in this respect are no different from long-style flowers of Calimyrna figs. A gall may be defined as an abnormal swelling or tumorous growth on plants, caused by an insect whose larvae feed on the gall tissue. The fig wasp larva is clearly a seed predator feeding inside the ovary of a normal flower. The "gall controversy" is complicated because food tissue (endosperm) for the developing larva may be initiated parthenogenetically (without pollination and fertilization), possibly by a mechanical or chemical stimulus during oviposition. In this case the flower functions like a minute gall, except there is no apparent tissue malformation as in typical insect galls.

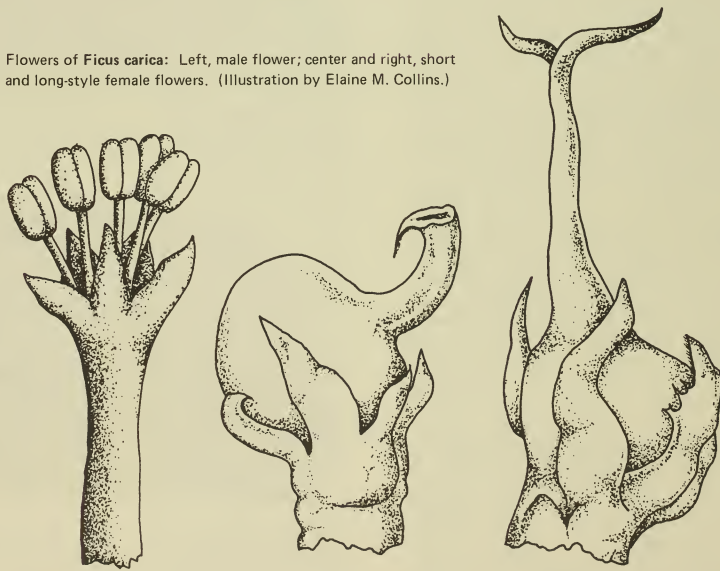
Many authors dating back to Aristotle and Theophrastus thought the caprifig was the wild form of *Ficus carica*, while the female trees bearing edible figs were cultivated. They are actually two natural sexual forms of the same species. Caprifigs are naturalized in moist riverbeds and creeks of southern California amidst thickets of willow and cottonwoods. They occasionally appear as seedling volunteers in urbanized areas, probably dispersed by birds. The syconia contain clusters of pollen-bearing male flowers (each

with five stamens) in the ostiolar region. During wasp exodus season in June, they are filled with black, winged female wasps and amber, wingless males, and literally "smoke" with pollen. Some caprifigs in northern San Diego County have smaller, purple syconia and velvety-pubescent branchlets. These trees may be the closely related *Ficus pseudocarpa*. Several cultivated varieties of caprifigs are sweet and palatable, including the 'Cordelia' and 'Brawley'.

Caprifigs of *Ficus carica* produce three crops of syconia per year: the profichi which ripen in early summer; the mammoni which ripen in fall; and the mamme which overwinter on the tree and ripen in spring. Only the ripe profichi crop sheds pollen, and these are used to pollinate the Calimyrna figs. The overwintering mamme crop house wasps through the cold winter months, and are quite visible on the leafless branches. Female trees produce only two crops of syconia annually, a breba crop which ripens in early summer and a second (main) crop which ripens in fall. During the receptive (immature) summer stage, this second crop receives pollen from the mature caprifig profichi crop. Although caprifig syconia incubate and perpetuate the tiny fig wasp, seeds may also develop in the short-style flowers. This is especially true of mammoni syconia in which pollination (from profichi crop) results in some ovaries (without wasps) developing seeds with viable embryos.

One hazard of wasp pollination is the transmission of internal rot fungus or endosepsis (*Pusarium moniliforme* var *fici*) from caprifigs to Cali-

Flowers of *Ficus carica*: Left, male flower; center and right, short and long-style female flowers. (Illustration by Elaine M. Collins.)





Left to right: Magnified view of fig wasps (*Blastophaga psenes*): The winged female (left) is shiny black with a threadlike ovipositor at the tip of her abdomen. The amber male is wingless with a long, tapering abdomen. (The wasps are about 2 mm long.); (center photo) Female fig wasp inside the ovary of a short-style female flower of a caprifig.; (right) A tuft of detached wings where several female wasps entered the ostiole of a receptive, green syconium.

myrnas. In early spring the entire mamme crop is harvested. Sound syconia are split open and dipped in a fungicide. They are placed back in the caprifig trees so emerging wasps can enter the receptive profichi crop. Since the mamme crop does not shed pollen, the mere act of oviposition stimulates endosperm formation and food tissue for developing larvae within ovaries of profichi syconia.

Most tropical species of *Ficus* bear several crops of syconia throughout the year, with short and long-style female flowers and male flowers in the same syconium. Since the female flowers are receptive several months before the male flowers release pollen, they require wasp pollination between synchronized syconia of the same or different trees. There are more than 1,000 recognized species of *Ficus* in the world, and each one has its own species of wasp! Pollination and seed production is essential for the dispersal and perpetuation of fig species and their symbiotic wasps.

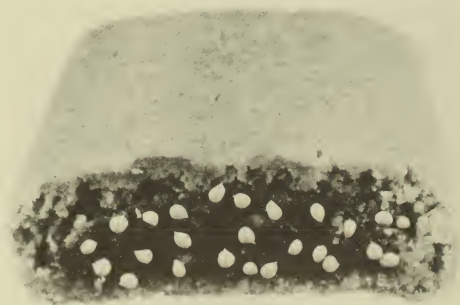
In his monograph on cultivars of edible figs (*Hilgardia*: 23: 323-538, 1955), Ira J. Condit lists 478 varieties of common-type female trees that do not require caprification. Several popular varieties grown in southern California include the 'Mission', 'Kadota', 'Brown Turkey' and 'Conadria'. Unlike the Calimyrna, the syconia remain on the branches and ripen without wasp pollination. The drupelets inside develop parthenocarpically and the crunchy little endocarps are generally hollow and without mature seeds. The cultivar 'Mary Lane' has very little sclerified (woody) tissue in its endocarp and is ideally suited to denture wearers. Occasionally, female trees may produce apomictic seeds without pollination and fertilization. The seed embryo develops from an unfertilized egg (or another cell within embryo sac), or from nucellar tissue surrounding the embryo sac. Apomictic seeds enable the propagation of choice

edible fig cultivars without the transmission of a mosaic virus disease through cuttings.

Calimyrna figs are a high-energy, nutritious fruit, high in vitamins, calcium, phosphorus, and iron. They are easily digested and are an excellent source of natural fiber. One large dried fig contains about 65 dietary calories (kilocalories). The California Fig Institute, located in Fresno, has prepared an extensive list of delectable fig recipes, from fig muffins and cookies to fig puddings and pies.

So the next time you enjoy a dried Calimyrna fig, or munch on a premium fig newton, think about the female wasps that literally gave their lives to make this delicious fruit possible.

(For an excellent summary of the biology and culture of figs the following reference is recommended: "Figs" by William B. Storey. In: *Advances in Fruit Breeding*, Purdue Univ. Press, 1975, pp. 568-589.)



A fig newton showing numerous seed-bearing endocarps from female flowers of a Calimyrna fig. (Budget-priced fig newtons may contain seedless endocarps from unpollinated common-type figs.)



Olivenhain Gardens Top Winner *Show*



Photo by Wilbur H. Glover

Olivenhain Gardens won two of the top awards at the Del Mar Fair's 1988 flower and garden show: the Paul Ecke Sr. Trophy for the best overall landscape, and the Landscape Contractor's Trophy.

Its "Mexican Garden" included a gazebo with heavy timber, tiles, a Mexican fountain, and a profusion of bright, blooming flowers typical of gardens south of the border.

Evergreen Nursery's "Prehistoric San Diego Garden" won the Superintendent's Trophy, with its almost life-sized dinosaurs, cave, waterfalls, and primitive species of trees.

The theme of the flower and garden show this year is "The Gardens of San Diego," and Evergreen chose to illustrate it with plants and reptiles that might have been here millions of years ago.

The award for the best representation of the theme went to Stubbs Fuchsia Nursery of Encinitas for its garden patterned after one of the Hotel del Coronado's gardens, a Victorian fuchsia garden.

A "special award for outstanding use of site" was given to Nurseryland Garden Center for the way in which it transformed the entrance to the flower show into an attractive redwood walkway through five different San Diego gardens.

The "best water feature" was built by Rock Supply of Leucadia depicting a mountain waterfall, an old-fashioned irrigation system with a miner's shack and pine trees. For this, Rock Supply also got the award of "best new exhibitor."

The best bonsai specimen was an 80-year-old dwarf olive tree, entered by William John Jackson of Lakeside. It is a natural mountain landscape with a picnic set in a forest.

The best junior landscape garden was put together by the El Capitan High School Future Farmers of America of Lakeside.

Other winners in the Del Mar Fair flower and garden show were: the California Protea Association, which was awarded the Don Diego Trophy, a new trophy awarded to the best non-commercial exhibit; the San Diego County Flower Association, which won the Flower Bowl for its scene that incorporated a "woodie" station wagon, surfboards and flowers grown and arranged by growers in the county; and Canterbury Gardens won the "best use of color" for its garden with English cottage.

Others were: M. & J. Buckner, who won the top award for "outstanding plant specimens," with their display of specially trained succulent cactus, and other unusual plants with exotic shapes; and the best landscape feature, a Western desert scene, entered by Cassidy Stagg Landscape Construction.

Among the agricultural and resource exhibit winners were: the Temecula Valley Wine Society for the best overall exhibit; and the San Diego County Department of Agriculture for the best theme representation, with its "country vegetable stand."

Year after year, the flower and garden show has been one of the most popular exhibits at the fair. This is due largely to the quality of its displays and landscapes.

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Shirley A. Kenson, CPA

AUDITOR OF SAN DIEGO FLORAL ASSOCIATION

786 Grissom Street, San Diego, CA 92154

The Effect of Smog On California Plants

By California Air Resources Board

California has the richest and most productive farmland in the world. Last year, California farmers received about \$14 billion for their products. Associated industries such as packing, canning, textiles and machinery brought the total economic worth of agriculture to California to more than \$35 billion.

But California's number one industry may be losing from \$150 million to \$1 billion a year to smog. Smog damage is a major reason why such crops as spinach, celery, lettuce, tomatoes, string beans and cucumbers are no longer grown commercially in and around Los Angeles County.

In addition to crops, smog damages forests and range and pasture grasses which produce almost \$700 million in revenue for the state each year. These natural ecosystems account for approximately 85 percent of California's land area and provide Californians with recreation and watershed land as well as supporting the timber and livestock industries.

HISTORY

In the 1940's researchers in southern California were baffled by what they called "X" disease — damage to trees which could not be traced to any source. By the early 1950's, however, a clear link had been established between smog in Los Angeles and damage to plants. Studies confirmed that pollutants emitted from factories and freeways were carried by the wind to agricultural areas downwind of cities such as Los Angeles.

By the mid-50's, smog damage to crops was reported near Bakersfield and Fresno and by the mid-60's, smog damage was apparent in most important agricultural regions of the state.

California's forests have not escaped pollution damage. Extensive injury to trees was noticed in the San Bernardino mountains during the 1960's and injury to trees in other southern California national forests and the Sierra Nevada was first reported in the 1970's.

HOW SMOG AFFECTS PLANTS

| | |
|----------------|-----------------|
| Injures Leaves | Reduces Quality |
| Reduces Yield | Causes Death |

WHICH POLLUTANTS INJURE PLANTS?

Air pollution interferes with photosynthesis, the process by which plants use sunlight to convert water and carbon dioxide to food and fiber. This causes leaves to yellow and develop dead areas. Smog also reduces yield, carbohydrate content and the weight of plants and crops, reducing their market value, food content and aesthetic appeal. This damage also makes some vegetation more vulnerable to disease and insect damage.



OZONE

Ozone, the colorless, toxic gas that is created when hydrocarbons and emissions of nitrogen oxide from industry and automobile exhaust react chemically with sunlight, is California's greatest smog problem and the most serious threat to vegetation. Ozone attacks leaves, causing them to yellow, develop dead areas and drop early. Exposure of plants to low levels of ozone over long periods can reduce growth and yield and increase susceptibility to disease and insect attack.

SULFUR DIOXIDE

Research indicates that sulfur dioxide (SO_2), which is released mainly in the burning of coal and oil in power plants, refineries, steam generators, and factories, also damages plants. Short-term, high-concentration exposure of vegetation to SO_2 creates dead spots on leaves and reduces photosynthesis. Long-term, low-concentration exposure to SO_2 can reduce root and stem weight, reduce protein and carbohydrate content and ultimately result in the death of plants.

OTHER POLLUTANTS

Other less-common pollutants also affect vegetation. Fluorides, ammonia, and ethylene, by-products of various industrial processes, as well as boron and hydrogen sulfide, associated with geothermal development, can injure leaves and reduce plant growth.

HOW WEATHER, GEOGRAPHY AND AIR POLLUTION AFFECT VEGETATION

California's unique air pollution conditions cause severe problems for vegetation. The mountains surrounding our valleys form basins that trap and hold air pollutants. While pollutants spread throughout these basins, warm air inversions often put a lid on the air in the basin, preventing escape of pollutants to the upper air. All of California's important agricultural areas are located in such basins. Furthermore, air in the basins gradually moves up the slopes of the mountains during the warmer part of the day, carrying pollution to the forests.

MAJOR CALIFORNIA CROPS AFFECTED BY POLLUTION

The effects of air pollution on several California crops and plants have been documented over the past few years through experiments in which crops are grown in filtered, unpolluted air and in smoggy air. Results indicate that a number of important California crops produce less yield, mature more slowly, or suffer tissue damage when grown under smoggy conditions.

COTTON

California's \$1 billion a year cotton crop is significantly affected by air pollution. Several varieties have been studied over a ten year period. In addition to obvious leaf markings, ozone causes the flowers to drop off resulting in fewer bolls per plant. A study of the SJ-2 variety of cotton, the most common variety in the San Joaquin Valley, showed a 14 percent loss in weight of cotton fiber per plant. Fiber length and elasticity which make cotton stronger and more marketable also are affected. The scientist who conducted the study believes that cotton growers may be suffering a 10-percent loss from air pollution at current levels.

KIDNEY BEANS

The leaves of kidney beans develop dead and yellow spots in smoggy air, and bean plants die sooner than those grown in clean air. Plants grown in clean air also begin flowering earlier and, as a result, set pods earlier. Even more important, the effects of ozone and sulfur dioxide reduce the weight, number of seeds and pods and yield of kidney beans.

LETTUCE

Lettuce, when exposed to polluted air, produces smaller, lighter heads. More importantly, leaves develop dead areas which is critical to their market value. Losses in yield are seen even when there is little or no leaf damage. Additionally, the exposed lettuce is thin and fragile to the touch, suggesting that it would suffer more damage in transit to the grocery store. These effects occur at ozone levels below the current California air quality standard (0.10 parts per million parts of air for 1 hour).

TOMATOES

Both ozone and sulfur dioxide can reduce the yield of canning tomatoes. Growing tomato plants in the outside air of Riverside reduced commercial yield, plant weight and the number of red tomatoes. Pulp color also was below acceptable canning standards. The crop would have been a serious loss to a grower planning to market it.

CITRUS FRUITS

In a study of the effect of air pollution on commercial citrus trees, navel orange trees produced approximately 50 percent more fruit when protected from smog. Also fewer leaves were dropped by trees protected from smog.

ALFALFA

Air pollution also reduces the yield of alfalfa grown in the San Joaquin Valley. A recently completed study by the University of California found that current levels of air pollution reduce the yield of Moapa, a variety of alfalfa, by 8 percent. The study also shows that relatively low levels of sulfur dioxide reduce Moapa yield by 10 percent. Another important aspect of alfalfa production is how long a planting lasts in the field. This study, which was carried out over three years and involved 20 cuttings of the alfalfa, showed that smoggy air reduces hardiness and persistence, allowing weeds to invade the fields, and reducing net income per acre. Leafiness, the amount of leaves vs. the amount of stems, is also reduced in the Moapa variety.

POTATOES

Russet "Centennial" potatoes, a valuable crop in the San Joaquin Valley, is particularly susceptible to air pollution damage. A study done in Riverside, California demonstrates losses in yield of more than 40 percent in total potato number and yield in smoggy air. Both leaf and root dry weights are also reduced.

GRAPES

Research in progress by the University of California found that Thompson Seedless Grapes produced 25 percent less yield in the San Joaquin Valley due to air pollution. Grapes grown in clean air had more and larger bunches of grapes. Sugar content of these grapes is not currently affected by air pollution in the valley.

Another study using Zinfandel grapes, however, showed that this variety formed less sugar when grown in polluted conditions. Zinfandel grapes grown in the smoggy air of Riverside produced 60 percent less yield.

ORNAMENTAL PLANTS

Many types of shrubs, annual flowers, lawn grasses, trees and other plants grown in urban areas are sensitive to air pollution. Disfigured leaves and fewer blossoms can detract from the beauty and value of the ornamental plants that

Californians spend millions of dollars for every year.

COMMON ORNAMENTAL PLANTS SENSITIVE TO SMOG

| | | | |
|------------|----------|------------|-------------|
| Zinnia | Oleander | Periwinkle | Sycamore |
| Lilac | Azalea | Petunia | White Birch |
| Blue Grass | Fuschia | Rose | Primrose |

NATIVE PLANTS

Air pollution is known to harm all major native plant groups including flowering plants, conifers, ferns, mosses, lichens and fungi. In The Geysers region of Napa, Lake, and Sonoma counties, injury to native plants, such as oaks and maples, has taken place downwind of geothermal power plants. Trees and other plant life in the Central Valley and adjacent Sierra Nevada suffer from air pollution generated in the urban areas of the Central Valley. Sequoia-Kings Canyon National Park and the Sequoia and Sierra National forests have been injured by smog formed in the San Joaquin Valley.

Since vegetation injured by air pollution was first noted in Southern California, it is not surprising that the national forests in the South Coast Air Basin continue to show heavy to moderate injury. Pine needles exposed to ozone develop yellow, blotchy marks and needles older than two years fall off, giving branches a scraggly, whiskbroom appearance. Needles and debris from trees killed by smog not only increase the risk of forest fire, but reduce seed germination and the chances of seedling survival.

Coastal sage scrub, chaparral, and native plants in the Mojave Desert are also sensitive to air pollutants. The most important effect is a reduced ability to cope with drought, disease and insects. Air pollution may put these plants at a reproductive disadvantage by causing them to produce fewer seeds. These conditions can lead to changes in succession resulting in a totally different plant community occupying a site.

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Surinam Cherry

(Pitanga)

From Mar Vista Ranch Nursery

DESCRIPTION

Surinam Cherry or Pitanga (*Eugenia uniflora*) is native to southern Brazil & Uruguay. A large evergreen shrub or small tree, usually less than 10 ft. high. It has a compact growth habit with thin wiry branches. The leaves are small (1-2"), highly aromatic and wine-colored when young, becoming glossy green. Many small (½") creamy white flowers bloom in spring and summer. Fruit is 3/4-1½" diameter and 8-ribbed, usually dark red or almost black. The flavor is aromatic, sweet, and pleasant in better selections.

GENERAL CULTURAL CONSIDERATIONS

Climate: Can be grown in areas where temperatures do not fall below 20-22°F. Will grow in hot inland areas as well as coastal areas, if drainage is adequate.

Soil: It is not demanding with regard to soil.

Planting: Container grown plants can be planted anytime but preferably in spring. A thick mulch around the plant is helpful to prevent drying out.

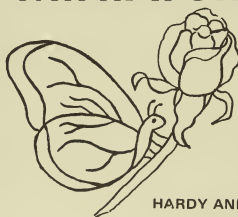
Irrigation: A key requirement is regular and adequate watering.

Fertilization: Fertilizers recommended for acid-loving plants are suggested.

Pruning: Can be pruned as a shrub, tree, or hedge. Prune soon after fruit is gone, before flowering.

Pests and Diseases: None.

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James Schultz Award Presented To Penny Bunker

By Carol Roller

On June 4, 1988, the International Geranium Society (IGS) honored Penny Bunker with its James Schultz Award, which pays homage to persons who provide consistent behind the scenes support to geranium activities. Meeting in Los Angeles on the occasion of its 35th anniversary, IGS recognized Penny for her work on behalf of San Diego Geranium Society. Penny and her late husband Walter were active members of several San Diego plant societies.

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San Diego Floral Association's library has acquired files of the *Journal of the American Society for Horticultural Science*, together with a set of *Proceedings* for the years 1919-1968. There is also a collection of the magazine *Hortscience* for 1966-1987. These materials are indexed, so they are a significant resource. Grateful thanks to Grace M. Cheng for this gift.

Choose A Tobira— Many People Do

By Melba Davis
California Association of Nurserymen

One of the most popular varieties of *Pittosporum*, a family of evergreen shrubs and trees, is the **tobira**. It is a small, dense shrub that can also be trimmed into a small patio or street tree. As with the family in general, the **tobira** is valued by Californians for its foliage and form. They are basic, dependable shrubs that can be a garden's all-year backbone.

The **tobira** can be kept at a happy six feet high by heading back and open trimming, although it can reach 15 feet if you so desire. The leathery, dark green foliage always has a shiny, clean look. The oblong leaves are rounded on the end. Beautiful clusters of creamy white flowers that bloom in the spring are fragrant like orange blossoms. As the flowers fade, they are replaced by round, greenish fruit that turns brown in the fall and then splits open to reveal bright orange seeds. It can be used for screens and massing, as well as an individual small tree; it's especially effective in containers.

The 'Wheeler's Dwarf' has the same handsome leaves as its parent, but comes in an extremely dense one to two-foot plant. This kind does not flower, so it is excellent around pools. It is a good choice for foreground, low boundary plantings, or even a small-scale ground cover. The variegata kind is a smaller **tobira**, usually limited to five feet tall, and just as wide. The foliage is more of a grey green, and is edged in white. Although it can lose some leaves in the winter, it quickly recovers as spring approaches.

The **tobiras** are hardy in all areas of California except the very coldest. While they are fairly-drought resistant, they do have a greener, lusher growth when watered regularly and fertilized at least once each spring or summer.

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Cut Your Landscape Water Use By 40 Percent

By Larry Rohlfs
California Landscape Contractors' Association, Inc.

At 4 a.m., an automated sprinkler system turns on, timed to irrigate when evaporation is low. The sprinkler heads are matched, providing an even spray over the lawn area; at 4:12 a.m., the sprinklers shut down before water runs into the gutter.

One week later, an overnight storm soaks the lawn; a rain switch trips the automatic system to postpone the unnecessary 4 a.m. watering.

"Using these effective water management practices and investing in the right kinds of irrigating equipment can cut landscape water use by up to 40 percent," said Barry Cohen, president of the California Landscape Contractors Association.

"Since the 1977 drought, the state's landscape industry has introduced and proven several water-conserving systems and plant selections. With these improvements, many landscapes now consume up to 40 percent less water than they did 11 years ago," said Cohen. "This technology is available for homeowners if they seek it out."

Some recommendations from the California Landscape Contractors' Association:

* Use a multiple program automatic sprinkler controller. With a multiple program, different areas can be irrigated on separate schedules. Multiple programming is particularly useful for a system that waters both lawn and shrub areas.

* Avoid runoff by watering correctly. Water between the hours of 10 p.m. to 6 a.m., when winds and evaporation are lowest. With clayish soils, you may need to water in several short repeat cycles to saturate the roots and still avoid runoff. But do not confuse this method with the bad practice of frequent or even daily light waterings; instead, irrigate infrequently but deeply.

* Use matched precipitation rate, low gallonage sprinkler heads. When sprinkler heads are not matched, the result is uneven coverage and runoff. The matched-head system will provide less flow to selected sprinkler heads in order to ensure proper spray coverage. Consult with irrigation supply professionals to obtain quality equipment that is suited for the design of your system.

* Consider installing check valves if there are elevation changes in your landscape. After a sprinkler system without check valves is shut off, water remaining in the pipes will flow to the lowest-elevation sprinkler head and leak out. Pressure-sensitive valves will keep the heads closed and retain the water in the pipes until it is turned on again.

* Add a rain switch to your controller to cut off timed systems when the weather does the watering. For less than \$100, a rain cup can be added to your timed system. When natural precipitation fills the cup, it cuts off the usual timing cycle, preventing the wasteful sight of sprinklers running during a rainstorm. More sophisticated soil moisture sensors can be linked to control systems to activate irrigation as needed.





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* Install a drip irrigation system for shrubs, trees and ornamentals. Emitters on the irrigation line can be regulated to discharge the proper amount of water at each location. Remember to check each emitter right after an irrigation cycle at least weekly; they can become clogged with dirt.

* Help your lawn breathe and retain water. Aerate, particularly on slopes, to increase water and oxygen absorption. Use soil penetrants to reduce compaction. Thatch (dead stems and roots) should be removed. For new lawns, polymers can be worked into the soil that absorb water and slowly release it to irrigate roots.

* Condition your lawn to use less water. Go easy on fertilizing with nitrogen; build up drought tolerance with potassium. Increase the height of the lawn-mowing cut to expand the root system. Leave clippings after the cut to help the lawn retain moisture. For shrubs, use mulch to retain moisture at the base of the plant and prune properly to reduce transpiration (loss of water vapor through the leaves).

* Consider xeriscape, landscaping with low water requirements in mind using native and other drought-resistant plants. Landscaping specialists have developed many innovative designs and combinations to provide attractive xeriscape options. Be advised, however, that establishing new drought-tolerant plant varieties can require as much or more water as maintaining a traditional landscape.

* Utilize a professional landscape contractor or architect to create a total water management plan. A professional will install quality materials and set up an irrigation design and system that will save water and maintain a healthy garden for your home.

Effective water management techniques can quickly be paid back in lower water bills, especially as water rates rise in response to drought conditions. Upgrading your irrigation system can save both water and money.

For \$1.00 each, single copies of **CALIFORNIA GARDEN** magazine may be purchased from: CALIFORNIA ARBORETUM FOUNDATION, Inc. 454-4241; MISSION HILLS NURSERY 295-2808; OUCHI NURSERY 263-6114; PACIFIC TREE FARMS 422-2400; SAN DIEGO FLORAL GARDEN CENTER 232-5762; WALTER ANDERSEN NURSERY 224-8271

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No-Cost Bathtub Water Can Save Gardens From Drought

By Marc S. Caspe

With the drought likely to last through the summer months and water rates climbing to punitive levels, many homeowners and gardeners stand to lose their landscaping investments. Torn between a decision of losing their beautiful gardens or paying very high water rates and using up valuable drinking water; homeowners face a difficult problem. To solve this dilemma, GARDEN SAVIOUR was developed as a money-saving device for delivering bathtub and shower waste water to the garden without any mess or fuss, providing double value for every water dollar.

A few minutes is all it takes for this unique device to start bathtub water flowing to the garden. GARDEN SAVIOUR can deliver a full 60 gallon tub of water in just five to ten minutes of flow time. It is engineered to deliver clarified bathtub water that has been separated from the suspended solids and soapy scum that floats on top of the bath. Water can either be delivered directly to the garden, or stored in containers for later use. During flow-time the homeowner has nothing to do to operate the system and is free to do other chores.

GARDEN SAVIOUR is available — with full instructions and our money-back guarantee — for only \$19.95. Hook-up is easy and no plumber is needed, however an appropriate length of hose must be provided by the homeowner. Homeowners can order as many as they like for gifts or for resale at garden clubs and church groups. For a limited time, the per unit price of \$19.95 includes tax and shipping charges, when paying by check or money order sent to:

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Brahea Edulis In The Wild

By Bill Gunther & Paul Mahalik

On March 27, 1988, 32 passengers and a ship's crew of eight departed San Diego for Isla Guadalupe on the chartered sport fishing vessel "Pacific Queen". This is believed to be the first time since 1981 that the Mexican government has permitted visitors on the Island, which is a military reservation, and which is the only place on earth where the palm *Brahea edulis* grows indigenously.

Isla Guadalupe is Mexico's western-most possession; it is home for perhaps 100 Mexican military personnel, abalone fishermen, and goat hunters. Located about 250 miles southwest from San Diego and about 160 miles west of Baja California, latitude 29N, it is about 25 miles long and 7 miles wide; it is a volcanic island, estimated at seven million years of age, which never has been attached to the North American mainland. From a deep gorge in the Pacific Ocean it rises steeply, in places almost vertically, to a height above sea level of about 4300 feet.

How the botanic predecessor of *Brahea edulis* ever reached Isla Guadalupe is a riddle which bothers every person who has studied this palm. The Genus *Brahea* is prevalent on the Mexican mainland and in Baja California, but the viable seeds of *Brahea* do not float, and the prevailing currents of the Pacific Ocean would take any mature *Brahea* palm which during a storm was washed into the sea southward - rather than westward toward Isla Guadalupe. No known bird, or animal, or fish would have any capability or reason for carrying a *Brahea* seed from Baja California to Isla Guadalupe. And the palm was on Isla Guadalupe thousands of years before there arrived in Baja California any human being who might have carried it there.

But nonetheless, somehow, sometime in history, a *Brahea* seed reached Isla Guadalupe. It sprouted on the inhospitable shore where it landed, and somehow managed thereafter to get its strong-hold on a steep savannah between 2 and 3 thousand feet above the cliffs in the more hospitable conditions which prevail on the fog-drenched northwestern slope of the Island. There the palm prospered, and evolved into a very distinct species, *Brahea edulis*. Unaccountably, during its evolution, it developed seeds much larger than any of its mainland forebears; these seeds covered by a layer of sweet pulp (almost in the fashion of a date), from which was derived its specific name "*edulis*", which means edible. But why did it develop edible sweet pulp over its seed when

no known animal ever existed on Isla Guadalupe (before around 1830) to eat that sweet pulp? And why, with no animal existing on Isla Guadalupe which might eat the palm, did it retain sharp spines on the petioles of its young leaves?

The answers to these questions are an enigma; these questions are one reason why *Brahea edulis* is so interesting to taxonomists. Edward Palmer was the first botanist to visit Guadalupe in 1875. He identified 117 species of vascular plants, 20 of which are endemic; that is not existing anywhere else in the world. The moister northern end of the island supports Monterey pines and cypress trees (many over 60' tall) in large numbers at its highest elevations in contrast to several species of lichens at its southern end which only receives about 4" of rain per year.

To the scientists, as well as the Society



This photo, taken during a break in the usual fog, vividly shows the current status (April 1988) of the palm *Brahea edulis* on Isla Guadalupe, Mexico — its only native habitat. In the foreground are a few old palms with trunks badly mangled by goats. The scattered dark spots on the savannah below also are old palms, equally chewed up. All young palms and all palm seeds which drop are eaten by the goats; other plants are eaten too. About 1100 old dying palms are the survivors of what once — before goats — was a large and healthy palm forest.

members, the trip was a great success. The seas enroute and during return were pleasantly calm, and the weather during our trip was unusually and exceptionally ideal. In contrast to the usually fogged-over condition, sunshine prevailed, as is evident by the photos which illustrate this article, taken by the authors.

And just what happened around 1830 on Isla Guadalupe to significantly change the situation? What happened was that an unidentified clipper ship, probably Spanish, dropped off some domestic goats, probably to provide a fresh supply of meat for future stops there.

In the absence of natural enemies, these goats multiplied to the maximum ability of the Island to provide forage for them. While they devastated the Island's flora, one of their main forage items is the large meaty seeds of *Brahea edulis*. After the goats arrived, every last *Brahea* seed which dropped in an accessible spot was eaten by the goats, and every last seed which dropped inaccessibly between rocks and there sprouted was eaten as a young seedling by the goats. Thus it is that the youngest *Brahea edulis* alive on Isla Guadalupe now is perhaps 150 years old. Since the average lifespan of a *B. edulis* is estimated at around 180 years, the very existence of this palm on Isla Guadalupe — its one and only native habitat — is limited to perhaps thirty more years.

The palms also inhabited a deep canyon, Barracks Canyon, on the Northeast side of the island. This small grove has been destroyed by the inhabitants of the islands in recent years for food and shelter material.

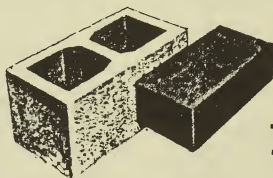
If the goat population on Isla Guadalupe were exterminated during the next thirty years, *Brahea edulis* would survive there by reseeding itself. Or if a goat-proof fence were built and maintained around a cluster of the palms, young palm seedlings could sprout therein and perpetuate the species in its only native habitat. But who would donate the money to build and maintain such a fence? (God forbid that goats might get trapped inside an unkept fence!) And what organization would have sufficient lobbying strength to convince the Mexican government that palms, which provide nothing but beauty, are more important than goats, which provide meat to eat?

So let us prepare for the time, during the span of our lives, when the very beautiful palm *Brahea edulis* becomes extinct in its only native habitat.

Bill Gunther is Editor of the CALIFORNIA NEWS-LETTER of the International Palm Society. Paul Mahalik is a Landscape Architect with offices in Del Mar, California. Both are palm enthusiasts.

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Crassulas

By Dorothy Dunn

Crassulas belong to the huge and diversified family of **Crassulaceae**, which includes many of our familiar and favorite succulent genera such as **Cotyledons**, **Adromischus**, **Dudleyas**, **Echeverias**, **Graptopetalums**, **Pachyphytums**, **Sedums**, **Kalanchoes**, **Sempervivums**, and **Aeoniums**. They are native almost entirely to South Africa. There are well over 200 species of **Crassula**, plus numerous varieties, hybrids, and cultivars. They probably offer more in diversified plant forms than any other genus of succulents, ranging in size from the shrubby **C. argentea** ("Jade Plant"), which can eventually grow into a sizeable tree, down to such minuscule species as **C. Cooperi**, **C. reverbisetosa**, **C. comptonii**, and **C. socialis**. In addition, some **Crassulas** are small herbaceous annuals, of little interest to the collector of succulent plants. In habitat they may be found growing in conditions varying from full shade to full sun, and from moist to the most arid locations. A few species will tolerate some frost.

One distinguishing characteristic of the genus is that the leaves are always arranged in pairs alternating up the stems. Another rather unusual feature is the presence in some species of what are called **Hydathodes**. These are water-secreting elements on the leaves, usually visible as small dots or "pock-marks", and are not found

in any other genus of **Crassulaceae** in Southern Africa. Good examples of hydathodes are evident in some very common **Crassulas** such as **C. lactea**, where they occur along the leaf margins, and **C. multicaeva**, where they are scattered over the entire leaf.

The flowers of **Crassulas** are similar to those of **Sedums**, except that in some cases they are congested into more compact, stemless clusters. These "shaving-brush" type flowers usually occur in the highly-adapted, "mimicry" — type species such as **C. teres**, **C. pyramidalis**, and **C. mesembrianthemopsis**. The predominant color range is from white through pinks to bright red, although a few have a dull "mustardy" yellowish hue. In a few species the flowers are very fragrant (**C. falcata**, **C. teres**, **C. lactea**), but many of them rival the **Stapeliads** in being odoriferously offensive, particularly **C. 'Jade Necklace'** and the various forms of **C. corymbulosa**, and attract swarms of flies when in bloom. Although the flowers of many species are fairly insignificant, they are still a welcome addition to the colorful plants, since so many of them bloom during our winter months. It would be hard to find a prettier, more heart-warming sight than a specimen of **C. argentea** in full bloom in January. Other species bloom during our late summer and fall; it's possible, with a fairly representative collection, to have **Crassulas** in bloom almost the year around. **C. falcata** probably has the most conspicuous and attractive inflorescence in the genus, and has often been used by hybridizers as one parent for some of our finest recent cultivars.

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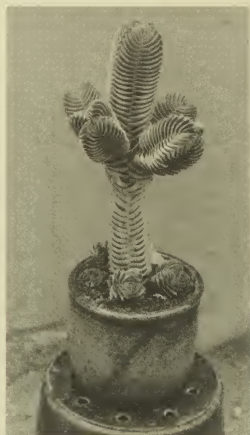


Some of the smaller species of *Crassula* are sometimes classified as "mimicry" plants because of their ability to conceal themselves in their natural habitat, or because of their resemblance to other things in their environment. Among these are *C. alstonii*, *C. cornuta*, *C. deceptor*, *C. columnaris*, *C. hemispherica*, *C. pyramidalis*, and *C. mesembrianthemopsis*. These species also seem to be more difficult in cultivation. There are also a few species which form underground tubers and are deciduous in summer, such as *C. nemerosa*, *C. capensis*, and *C. saxifraga*. These are seldom encountered in collections, being difficult, temperamental, and generally short-lived in cultivation.

Some *Crassulas* possess remarkable powers of absorbing water through capillary attraction — that is, by means of the hairs on their leaves. Included in this group are *C. barbata*, *C. columnaris*, and *C. pyramidalis*. A leaf of *C. barbata* can absorb more moisture in one dewy night than it can lose

through evaporation in a week.

Most of these plants are easily grown and are usually propagated from stem or leaf cuttings. Except for some of the previously mentioned mimicry-type species, they are generally quite tolerant of average watering, and thrive in your usual succulent soil mix. Most of them can be



CRASSULA BUDDIST TEMPLE HYBRID

By Myron Kimnoch

Photo by Wilbur H. Glover

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grown in full sun, and all of them need very strong light to maintain their best colorations and characteristic forms of growth. Exceptions to this would be the greener-leaved species such as *C. barbata*, *C. marchandii*, *C. pyramidalis*, *C. susannae*, and *C. socialis*.

They seem to be relatively free from pests or disease, although some of the flowers are susceptible to aphids.

Crassulas can be used in many ways in your gardens — the larger varieties are useful planted right in the ground as an integral part of your landscaping, and the smaller species make charming pot plants, hanging baskets, ground cover around larger plants, or subjects for dish gardens.

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Succulents (pp. 62 - 69)

UC Funds 19 Projects For Research Into Sustainable Agriculture

By John Stumbos

A University of California program to help farmers make a transition to "sustainable" agriculture recently approved funding \$250,000 for 19 separate research projects, according to its director.

"The widely ranging projects include studies into cropping systems, animal husbandry, pest control, new crop identification, post-harvest handling, marketing and an analysis of organic farming practices," explained Bill Liebhardt, Cooperative Extension specialist and director of UC's statewide sustainable agriculture program. "This research is part of our overall effort to develop alternative agricultural practices that are economically viable, enhance the land and people on it and cuts reliance on non-renewable natural resources."

Researchers include scientists from UC Davis, Santa Cruz and Berkeley and California Polytechnic University, Pomona, as well as Cooperative Extension farm advisors from Butte, Humboldt, Merced, Riverside, San Bernardino,

San Diego and Yolo counties. Other grant recipients include researchers from the Association of Applied Insect Ecologists, the Bio-Integral Resource Center, the Organic Market News and Information Service and the Steering Committee for sustainable Agriculture.

Some of the specific research topics include testing the potential of winter legumes to minimize salt and selenium build-up in the Central Valley, a comparison of rotational and continuous grazing systems and adapting Chinese pest management techniques in California.

The sustainable agriculture program relies on an interdisciplinary research and education strategy to help California agriculture deal with a variety of interrelated problems — fluctuating producer profitability, food and worker safety, increasing environmental regulation and international competition. For more information on specific research projects, contact Lyra Halprin at the UC Sustainable Agriculture Program in Davis at (916) 752-7556.

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Roses For A Moonlit Night

By Cindy Martin

Extend the time you enjoy your garden with a bed or border of white flowers and romantic white roses. By day, this planting will seem cool and serene, but at night it will take on an entirely different aspect. For in the moonlight, white flowers seem imbued with light, creating a glimmering garden of enchantment.

Probably the most famous white garden is the one designed by Vita Sackville-West at Sissinghurst in England. She utilized plants with white flowers plus those with grey or silvery foliage. The garden was set off with dark-foliaged evergreens as edging to the beds and as a tall background hedge.

To create your own white garden, select a site where it will be most enjoyed. Surround a patio, deck, terrace, or swimming pool, for instance, as this is where you'll probably be relaxing in the evening. You might want to include an ornamental pool planted with a white-flowered, night-blooming tropical waterlily to heighten the romantic effect.

White roses are stunning for their texture and fragrance, plus they are wonderfully sentimental. A regional All-America Rose Selections Communications Award winner for 1987 was Teddy Colbert with an article in the Los Angeles Times Magazine. She wrote that "a singular white rose is the only rose a lady may give and a gentleman may accept. The message is that 'I am worthy of you.' White roses symbolize wisdom, joy, and purity."

Other folklore concerning white roses is that the god of silence is represented by a young man holding a finger to his lips and a white rose in the other hand. A white rose was often depicted over dining room doors to remind guests to not repeat things heard inside. Also, white roses were hung over tables with the same purpose. Hence, the origin of the phrase sub rosa, or "under the rose."

There are any number of white roses from which to choose. A recent survey conducted for All-America Rose Selections, a non-profit organization that tests new rose varieties, verified that hybrid tea roses with their lovely, long-stemmed blooms are the favorite type of rose. Three of the best white hybrid tea roses are 'Pascali', 'Honor', and 'White Knight'.

'Pascali's' fragrant, creamy white flowers have almost perfect form, and a great many are produced. Plants are very vigorous and disease resistant with glossy, deep green leaves. The very long, pointed buds of 'Honor' open to a bright, silken white and are lightly fragrant. Plants grow well in a variety of climates with vigorous, dark olive-green leaves. Let a 'White Knight' save your garden with pure white flowers with greenish centers. Highly rated by the American Rose Society, the growth is vigorous and the foliage a light green.

The bushy, compact growth and large flower clusters of the floribunda rose make them a substantial addition to the landscape. Three of the best white floribunda roses include 'French Lace', 'Ivory Fashion', and 'Saratoga'.

You'll often find up to eight large ivory white, spicily scented flowers on each 6- to 10-inch stem of 'French Lace'. Plants grow as wide as tall and have dark green, holly-like foliage. 'Ivory Fashion's' flowers are also large with long, slender buds spiraling open to fragrant, ivory white blooms. 'Saratoga's' creamy white buds open to pure white flowers that are very strongly fragrant with that classic "old rose" scent. The latter two varieties grow 2-1/2 to 3 feet tall and have good resistance to diseases.

'White Lightnin' is a grandiflora rose with stunning white flowers and a very strong, citrus-like scent. The plants have glossy, dark green leaves and bear many flowers.

What are some other plants to combine with the roses in your white garden? Try white-flowered varieties of petunias, cosmos, flowering tobacco, tuberose, baby's breath, mums, delphinium, hosta, phlox, zinnia, salvia, moonflower vine, Shasta daisy, and peonies. Also try grey-foliaged plants like artemisias, lamb's ears, rue, and dusty miller.

To learn more about growing roses, send for a free 24-page brochure entitled "Discover the Pleasure of Roses." For your copy, send a stamped, self-addressed, 4 x 9 inch envelope to All-America Rose Selections, c/o Seltz, Seabolt & Associates, 221 North LaSalle Street, 39th Floor, Chicago, IL 60601.



Book Reviews

By Harry Tolen

THE ROSE GARDENS OF ENGLAND by Michael Gibson — 1988 — Pub. Globe Pequot Press, Old Chester Road, Chester, CT 06412. 70 color pictures, 160 pages, 8"x11", \$21.95 Hardcover.

In the early 1800's, when roses became really popular in Europe, England, and then America, they were usually confined to the houses of the wealthy. "It was a time when labor was cheap and manure was free!"

This book is a personal tour of many of the fine estates in England that are open to the public. Roses are shown "blended with other plants, reaching unbelievable altitudes up trees, ramping over walls, tumbling down banks, and generally behaving with almost unseemly abandon." The text describes the garden as you wend your way through it, naming the roses found there, and describing how they are used. There is a color picture accompanying many of the descriptions. It must have been very difficult to select which pictures would be used in this book, but the author succeeded in showing many of the early roses still used as originally planted in the 1800's.

The book will be a fascinating reading experience for any type of gardener. Interestingly written, and well documented, the information on each garden is intriguingly accompanied with historical facts and observations. The book can be used as a travel guide for these gardens, as there are maps for every garden with the "open to the public" times, phone numbers, etc.

WILD FLOWERS OF MAJORCA MINORCA IBIZA by Elspeth Beckett — 1988 — Pub A.A. Balkema, Old Post Road, Brookfield, VT 05036. Illustrated full page color plates, 221 pages, 7"x10", \$50.00 Hardcover.

This is definitely a book for anyone seriously interested in botany. The wild flowers found on three Islands off the coast of Spain called the Balearic Islands are the subject of the book. These islands are visited by some 4,000,000 persons a year and the flora of the Islands has been examined and described and published since 1879. This book is a condensing of several previous publications with a few of the author's new finds. It contains botanic descriptions, and instructions on how to use the book for identification for the complete beginner, for those who have some skills in botany and wish to go further, and for those who already have the skill of the botanist. Not much text, the book zeros in on the botanist's interests, and contains a complete botanic key of all the wild

flowering plants and weeds! EXAMPLE? "URTICA-CEAE — The plants in this family range from dull to frankly unattractive" but they are described with the same care. If you plan a trip to these Islands, and you are interested in botany, this botanist's handbook would be an absolute must. If your forte is in home gardening, I think you should pass on this one.

MODERN GARDEN ROSES by Peter Harkness — 1988 — Pub Globe Pequot Press, Old Chester Road, Chester, CT, Photos by Vincent Page, 96 pages, over 100 full color pictures, 8"x11", \$18.95. Hardcover.

An interesting background on roses suggests roses were growing in Asia, Europe, and the USA perhaps 25 million years ago. Sorry, no pictures of those, but a stunning collection of pictures and background with the good points and bad points mentioned of many modern hybrid roses. A section with basic cultural instructions is provided. You can plan your rose garden complete using the section "Recommended Varieties". This is also an important book for the rose hybridizer who can benefit from previous experiences of others, and perhaps read some special code from this to create his own perfect rose. The photography is excellent, so good I could almost detect the fragrance as I paged through the book. It is also a good book for your bookshelf. In the dead of winter, kick back in front of the fire, turn on the stereo, and leaf through these pages dreaming about how great the spring is going to be.

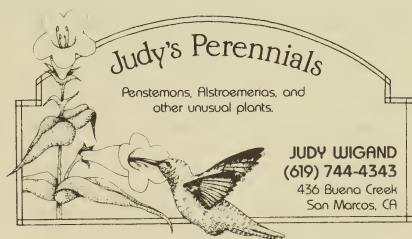
RHODODENDRONS by John Street — 1988 — Pub Globe Pequot Press, Old Chester Road, Chester, CT, over 100 color pictures, 144 pages, 8"x11", \$18.95. Hardcover.

A format identical to the previous reviewed Modern Garden Roses. The same sections with the same information, only this time for rhododendrons. The color pictures again are terrific. Over 100 full color pictures of these beautiful plants. Even though we in San Diego do not grow these plants because of the warm climate, this book will find a space on my bookshelf just because I like nice things. The book shows the same care as the other books in this series from The Globe Pequot Press, "Classic Garden Plants". They target a single type of garden plant for in-depth treatment. Each author is a renowned plant grower and nurseryman who writes with enthusiasm about the species he knows so well." So rather than just review this book, let me warn you about the rest that will deserve space on your bookshelf. "Dahlias", "Climbing Roses", "Fuchsias", "Azaleas", "Modern Roses", "Modern Garden Roses", and this book "Rhododendrons", all excellent entertaining books, and that's the name of the game, isn't it?

TREES AND SHRUBS FOR TEMPERATE CLIMATES (Third Revised Edition) by Gordon Courtright — 1988 — Pub Timber Press, 9999 S.W. Wilshire, Portland, OR 97225, 239 pages, 771 color photographs, 8 1/2"x11", \$45.00. Hardcover.

This is an update of an already acknowledged garden classic. First published in 1979 as a visual plant dictionary, the second edition, published in 1984, enhanced and expanded the information. This edition is simply marvelous! Timber Press as always did a beautiful job. The book is a must for anyone in the nursery industry, kind of a nurseryman's bible. Nursery students will find this consensus of information and the multitude of color pictures invaluable. The name "Trees and Shrubs ..." does not tell the full story. You will find vines, ferns, fuchsias, philodendrons, flax, reed grass, blue fescue, clivia, etc., along with all the trees and shrubs you ever wanted to know about. The plants are indexed in a variety of ways to make them easy to find even if you don't know the botanic name. There is a botanic name vs. common name list, and common name vs. botanic name list, a recommendation list, and lists like "List of plants with white flowers", "Low-growing shrubs", "Deer resistant plants for ornamental use", etc. The one fault I find with the book is that it completely ignores the faults of the plants involved. No mention of those that are poisonous, or messy, or especially prickly. The picture of the jacaranda tree, for instance, if you look very carefully, shows the ground blue underneath it. That is not a photo error, it's dropped blooms. The perfect place I recommend for growing that tree is in your neighbor's yard. Then you get to enjoy the beautiful sight, and he has to clean up after the tree. It constantly drops something, old blooms, old leaves, and even short sticks late in the season. But this is still a very valuable book, and I'm going to cut this short and go order mine right now!

San Diego Floral Library has received a gift of back issues of **The Begonian** magazine. This is a welcome addition to our files, which now go back to 1947. We still need 1951 to 1964 to fill gaps in the sequence. Can anyone help? We also need binders for better storage. Gifts are always gratefully received.



Library Donation

Reviewed by Bill Gunther

A new book in the library of the San Diego Floral Association is **Genera Palmarum**, by Natalie Uhl and John Dransfield. Published by the Bailey Hortorium (Cornell University) and The International Palm Society, this book has 33 pages of color photos and 51 pages of black and white photos, with total pages 610, each page at size eight and a half by eleven inches.

Not only is it a large work, it also is the most authoritative and the most contemporary work on palms in existence. The authors are the world's top authorities on palms; Dr. Natalie Uhl is on the faculty at Cornell University; Dr. John Dransfield is with the famous Royal Botanical Gardens at Kew, in England. Because there is no equivalent work even in the planning stages, it is certain that this new book will remain the chief reference work on palms for decades to come.

In the main, *Genera Palmarum* (the genera of palms) classifies all known palm species by genus. But in so doing, it also does many more things — including providing descriptions, background information, information on growing conditions, and information on uses of palms in their native habitat. All of the 304 photos (including 107 in full color) are well captioned, providing in themselves an excellent non-technical photographic review of the palm kingdom.

For use of the layman who might not understand the precise meaning of some technical terms used in the text, there is an illustrated glossary — 24 pages in length.

In the rare event that someone needs palm information not included in *Genera Palmarum*, the book also includes a listing of "literature cited", this being a palm bibliography — eleven pages in length.

In the Floral Association's library, *Genera Palmarum* is classified as a reference work — which means that it is not available to "check out" of the library. But next time that you have occasion to visit the Floral library, make it a point to spend a half hour leafing through *Genera Palmarum*. Your time will be well spent.

Editor's Note: Bill Gunther donated this book to the Floral library.

book review

On page 121 of Volume 79, No. 4, July-August 1988 issue of **CALIFORNIA GARDEN** the correct retail price for **THE HOSTA BOOK** by Paul Aden, 1988, Timber Press, Portland, Oregon, should be listed as \$29.95 plus \$3.00 shipping and handling, **not** the erroneous \$23.95 price.



check for scale, snails, and slugs — do not put bait in cups.

CACTI & SUCCULENTS

- maintain** a high moisture level, especially if dry hot winds occur.
- feed** low-nitrogen fertilizer.
- divide** overgrown plants and propagate new growth.
- repot** older rootbound plants — look for roots growing out of drainage holes.
- check** for pests such as scale and mealybugs, and take immediate action. Use full strength alcohol, either with a spray, or dab with cotton swab.
- protect** new growth from hot sun scald.
- guard** against slugs, snails and insects.

CAMELLIAS E.C. (Gene) Snooks

- continue** regular watering, especially during Santa Ana days when spraying of the foliage will also be beneficial.
- disbud**, leaving only one bloom bud per branch for largest bloom. Leave some further down the stem for later bloom.
- fertilize** with a low nitrogen fertilizer such as a 2-10-10.
- add iron** to increase bloom color.
- prune** out unwanted new growth.
- check** tags on all plants, and renew those which have faded.
- stake** the new growth before complete hardening.
- start** "gibbing" during the later part of this time frame for early bloom.

DAHLIAS Abe Janzen

- feed** with potash to promote root growth — it also helps them to keep better during the winter.
- clean** up old leaves and stalks, preparing for fall and winter storage.
- maintain** a regular watering program until the first of October, then cut down gradually.
- spray** to prevent mildew and spider mite.

EPIPHYLLUMS Frank Granatowski

- prevent** soil from completely drying out. An occasional misting or spraying of foliage can be beneficial.
- protect** plants from exposure to direct sunlight.
- protect** new growth from wind damage.
- bait** for snails and slugs. A few granules of "Sluggetta" at the base of the plant is very effective, and leaves little or no residue.
- practice** preventative maintenance regarding insect control. Use insecticides such as Malathion, or Orthene, only if absolutely necessary. Read and follow instructions on labels.
- give** plants a final feeding for fall — using a balanced fertilizer before they become semi-dormant.

BEGONIAS Margaret Lee

- take** cuttings to increase your collection and to share.
- feed** tuberous begonias in September as long as leaves remain green.
- start** withholding water from the tuberous in October, and of course, do not feed them again.
- give** a final feeding of the year in October unless you have fed all year around with a balanced fertilizer.

BONSAI Dr. Herbert Markowitz

- move** deciduous trees to cool shaded areas (if you live in southern California) so they do not sprout new growth.
- maintain** a regular watering schedule; keep moist but NOT wet. If temperatures are cool, be careful not to overwater.
- fertilize** lightly in October, if you failed to do so in September.
- transplant** specimens that require a different pot of new soil, but any drastic removal of the root system should wait until early spring.
- remove** all wires because the branches are growing larger. If the branches still need wire for training, put it on again this month, but rewrap at a different position to avoid cutting into the bark.
- transplant** or repot such trees as evergreens (black pines, Hinoki, juniper) and most deciduous trees, such as cypress, maples, pomegranate, podocarpus. Be sure to disturb the roots as little as possible during this period.

BROMELIADS Mary Siemers

- continue** feeding throughout the warm weather months.
- maintain** a regular watering program until the weather turns cooler. Keep moist especially during any dry Santa Ana winds. Do not water at all if the rain begins.
- cut** the pups that are at least one-third the size of the mother plant; leave others on until next spring.
- repot** to next larger pot-size, if necessary.
- keep** plants groomed by cutting dead blooms and discolored leaves.

FERNS Ray Sodomka

protect from hot sun, but give maximum light.

water and maintain humidity by keeping surrounding areas damp.

fertilize once with a high nitrogen fertilizer.

plant spore of all varieties.

trim off dead fronds, keep plants well groomed.

check for aphids, mealybug, and scale; may use Malathion-50. Keep snails, pillbugs, and slugs under control.

FUCHSIAS William Selby

pick off faded blossoms and seed pods.

protect plants from any hot dry winds.

maintain humidity by keeping area sprayed. Mist plants during Santa Ana days; but do not over water.

continue fertilizing for winter blooms.

take cuttings from good healthy growth — using only the tender tips. October is the better month to propagate new plants.

keep cuttings in a cool place for 4 to 6 days; keep moist but not wet or soggy.

spray for insect control — being sure to wet the underside of leaves; the hiding place for egg laying.

GERANIUMS Carol Roller

water thoroughly when plants become somewhat dry. Allow excess water to drain away. Keep foliage as dry as possible.

continue feeding with a balanced fertilizer dissolved in water — using less than the recommended strength. Apply as often as necessary to avoid nutritional deficiencies. Long term pellets may be used instead.

continue a pest control and disease prevention program — using all products according to the manufacturer's directions.

begin pruning. On regals, scented, and similar types, at least one green leaf should be left on each stem being cut back.

make cuttings from the prunings. Shelter cuttings from extreme weather.

keep all the plants tidy by removing faded flowers and discolored leaves.

continue to rotate plants on a regular basis in order to keep them well-shaped.

GESNERIADS Michael Ludwig

maintain watering program during dry, hot weather. Red spider will be a problem — spray with keltthane.

watch that plants remain in the shade as the sun is changing its position.

give less food to retard tender growth until after winter cold.

sterilize greenhouse, to have it ready for plants to be brought inside.

control pests. To prevent spread of disease and pests, check new plants and those to be brought in from outdoors.

IRIS San Diego-Imperial Counties Iris Society
feed established tall-bearded that are not being divided.

divide and plant clumps of bearded iris.

clean up the beds, and discard old fans and debris.

control slugs and snails.

plant beardless iris: spurias, Siberians, Louisianas, and Japanese varieties. Keep moist until well established.

Louisianas and Japanese are grown in pots, in pools, or in swampy conditions.

plant Dutch bulbous iris in October for spring bloom.

ORCHIDS Charles Fouquette

spray and mist especially when Santa Ana winds arrive.

begin low nitrogen, high phosphate, high potash feeding for cymbidiums.

water and mist cymbidiums, maintain humidity, and don't let the foliage burn.

check for any scale, or for sucking or chewing insects, and spray, or bait, accordingly.

clean up growing area, or greenhouse for winter.

check heat controls and fan controls for greenhouse; clean glass, check for clogged pilot in heater and clogged flues to vent pipes.

let paphiopedilums dry out a little when and if days cloud up.

do other work on plants that were missed earlier in the year.

feed phalaenopsis a 3-1-2- solution.

keep phalaenopsis damp because they have no storage bulbs as other types of orchids; Ascocendas and hybrids should be treated in similar manner.

be prepared for any great change in weather — can be hot and windy, or turn cold. If shade cloth is still up, be prepared to remove; if cold, increase heat in greenhouse.

seek help if you have problems with plants — contact good nurseryman or Orchid Society. They will help you with answers that puzzle you — where your plant came from, care needed, etc. Often the words "high, low, wet, dry, hot, cool," mean different things in the world of orchids..

ROSES Frank Hastings

feed with a balanced fertilizer. Water the day before fertilizing. Water in dry fertilizer.

feed 3 Tablespoons of liquid fish per gallon of water per bush two weeks after feeding dry fertilizer.

feed liquid iron the first week in September.

wash off spider mites with a jet stream of water under leaves weekly.

spray weekly with a mixture of Orthene and

a fungicide, as per instructions. Be sure to water the day before.

disbud for one bloom to a stem on Hybrid Teas and Grandifloras.

water at least twice a week unless 3/4 inch of rain falls in one week.

VEGETABLES

do the first plantings of cool weather vegetables for winter by setting started plants of cabbage and its relatives, and celery.

plant seeds of mustard, peas, lettuce, and root vegetables.

water deeply as needed — not light sprinkling.

harvest vegetables in prime condition to use and to encourage the bushes and vines to bear longer.

fertilize as needed, so plants grow vigorously, and bear larger and more succulent edible parts.

GREEN THUMB

divide daylilies, agapanthus, Shasta daisies, belladonna lilies after blooming.

feed well established shrubs with a balanced fertilizer; water thoroughly.

dust and stake chrysanthemums, but do not pinch tips any more; disbud for larger blooms.

prepare bulb beds; add humus. Do not plant at this time, but can get early bulbs in nurseries and place in refrigerator for a few weeks before planting.

mulch acid-loving plants, using peat moss, or ground bark.

plant spring flowers such as calendulas, cinerarias, snap-dragons, and pansies.

plant in October watonias, scillas, jonquils, and late October, put in some daffodils.

prune wisteria back to prepare vines for their spring blooms.



Ethel Hoyt Memorial Scholarship Fund

For many years, Ethel Hoyt was one of San Diego's leading floral artists. She organized classes and demonstrations in American flower arranging with leading designers. To keep the costs within any budget, she underwrote them. Whenever the San Diego Floral Association really needed a typewriter, bookcases, etc., Ethel would provide them. One month before her death, she gave us our new computer.

Her husband, Rowland Hoyt, was one of San Diego's first landscape architects. He designed Presidio Park and Mission Bay Park. He was also interested in education, and lectured to many horticulture classes.

Their combined contributions, too numerous to mention, have helped to make San Diego a nicer place to live.

The Board of San Diego Floral Association has voted to use the money given in Ethel Hoyt's memory for a yearly horticultural scholarship to a local college student. Only the interest from this fund will be used. The current fund will provide

only one \$100.00 scholarship. By increasing the fund, the yearly amount will be increased.

San Diego Floral Association is sponsoring an English Tea and Fashion Show on Saturday, August 20, 1988, in the Casa del Prado courtyard from 2 to 4:30 p.m. All profit from this delightful event will go into this Ethel Hoyt Memorial Scholarship Fund. This show will include music, booths, flower exhibits, a fashion show presented by Fun 'N Fancy Fashions, and a tea. Admission donation is \$10.00. For a donation of \$1.00, you could win in a drawing for a trip for 2 to London donated by American Airlines, a trip for 2 to Catalina donated by Fleetridge Travel, or 2 -\$50.00 gift certificates donated by Fun 'N Fancy Fashions of Point Loma.

Any contributions to the Ethel Hoyt Memorial Scholarship Fund will be appreciated. Send your donation to San Diego Floral Association, Casa del Prado, Room 105, Balboa Park, San Diego, CA 92101-1619, indicating it is for this fund.



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Pres: Helen LaGamma (619) 466-3793

7644 Circle Drive

Lemon Grove, CA 92045

4th Mon., Casa del Prado, 7:30 p.m.

BERNARDO GARDENER'S CLUB

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17888 Via Altiva

San Diego, CA 92128

CALIFORNIA ASSOCIATION OF NURSERYMEN

SAN DIEGO CHAPTER

Pres: Ted Kniffing 561-8320

14940 Oak Creek Road

El Cajon, CA 92021

4th Wed., 7 p.m. Place varies.

CALIFORNIA NATIVE PLANT SOCIETY

Pres: Joan Stewart 277-9485

4995 Mt. Almagosa

San Diego, CA 92111

3rd Tues., Casa del Prado, 7:30 p.m.

CHULA VISTA GARDEN CLUB

Pres: Mrs. Lucy Morrissy

P.O. Box 5447

Salton City, CA 92275

3rd Wed., Rohr Pk Manor, Sweetwater Rd.

Bonita, 1:00 p.m.

CITY BEAUTIFUL OF SAN DIEGO, INC.

Pres: Mrs. Ruth C. Smith 488-0830

4995 Fanuel Street

San Diego, CA 92109

1st Mon. S.D. Zoo, Rondavel Rm., 11:30 a.m.

CONVAIR GARDEN CLUB

Pres: Mrs. Virginia Soderberg 582-7098

6197 Arno Drive

San Diego, CA 92120

1st Wed., Casa del Prado, 7:30 p.m.

CORONADO FLORAL ASSOCIATION

Pres: Barbara Perkins 435-8822

840 Balboa

Coronado, CA 92118

Twice annually at call of President,

1113 Adelia Ave., Coronado, 7:30 p.m.

CROWN GARDEN CLUB

Mrs. William G. Williams 435-3985

821 Coronado Avenue

Coronado, CA 92118

4th Thurs., Coronado Library, 9:00 a.m.

DOS VALLES GARDEN CLUB

Pres: Mr. John Jacobelli 749-3303

26756 Banbury Drive

Valley Center 92082

2nd Tues. (except July and August)

Valley Center, CA 1:00 p.m.

EAST COUNTY ROSE SOCIETY

Pres: Harry Gray

561-4192

8124 Royal Park Lane

El Cajon, CA 92021-2183

1st Sun., various gardens, 2:00 p.m.

EXOTIC PLANT SOCIETY

Pres: George Plaisted 583-9551

6356 Delbarton

San Diego, CA 92120

4th Tues., Wells Rec Center

1235 E. Madison, El Cajon, CA 7:30 p.m.

FALLBROOK GARDEN CLUB

Pres: Mrs. Walter Brendel 723-7577

1636 Via Entrada

Fallbrook, CA 92028

Last Thurs. each month except 3rd Thurs.

Oct., Nov., Dec., St. Peters Church 10 a.m.

FLEUR DE LEAGUE GARDEN CLUB

Pres: Mrs. Robert K. Smith 457-3066

3270 Caminito East Bluff No. 95

La Jolla, CA 92037

2nd Mon., Home of Members, 10:30 a.m.

GROSSMONT GARDEN CLUB

Pres: Mrs. Dolores Smith 464-2457

7443 Orlan Avenue

La Mesa, CA 92041

2nd Mon. 4975 Memorial Drive

La Mesa, CA 92041, 9:30 a.m.

HEARTLAND AFRICAN VIOLET SOCIETY

Pres: Kemary Crowder 271-1844

8862 Shaula Way, San Diego 92126

3rd Thurs. 7 p.m. Home Savings,

396 No. Magnolia St., El Cajon, CA 7:00 p.m.

ICHIYO SCHOOL OF Ikebana

SAN DIEGO CHAPTER

Mrs. Haruko Crawford 465-3046

10411 N. Carlos Drive

Spring Valley, CA 92077

IKEBANA INTERNATIONAL

CHAPTER 119

Pres: Mrs. Rex (Kay) Yarnell 435-0910

501 Country Club Lane, Coronado, CA 92118

4th Wed., except July and Aug.

Casa del Prado, 10:00 a.m.

IKENOBO CHAPTER OF SAN DIEGO

2822 Walker Drive

San Diego, CA 92123

INDOOR CITRUS AND RARE FRUIT SOCIETY

Pres: Walter Doty (415) 948-3171

176 Coronado Avenue

Los Altos, CA 94022

INTERNATIONAL AROID SOCIETY

Pres: Bruce McManus (305) 271-3767

11691 SW 93 Street

Miami, FL 33176

LA JOLLA GARDEN CLUB

Pres: Mrs. Robert M. Boynton 481-0263

376 Bellaire Street

Del Mar, CA 92014

3rd Tues., La Jolla Woman's Cl., 1:30 p.m.

LAKE HODGES NATIVE PLANT CLUB

Pres: Dorris Baur 487-6614

16516 Gabarda Road

San Diego, CA 92128

3rd Mon. Glendale Federal

Rancho Bernardo 3:00 p.m.

LA MESA GARDEN CLUB

Pres: May Pollock 444-4983

6325 Primrose Drive

La Mesa, CA 92042

3rd Thu 11 a.m., La Mesa Woman's Club

5220 Wilson Ave., La Mesa, CA

LAS JARDINERAS

Pres: Mrs. Robert C. Macon 223-0118

467 San Fernando Street

San Diego, CA 92106

3rd Mon. Home of Members 10:30 a.m.

LEISURE WORLD GARDEN CLUB

Pres: Mrs. Wayne F. Dyer (213) 596-4161

13171 St. Andrews Drive 154L

Seal Beach, CA 90740

MISSION GARDEN CLUB

Pres: Mrs. Vera Elmer 447-8029

1285 E. Washington Ave., Space 109

El Cajon, CA 92019

1st Wed. North Park Recreation

Center, San Diego, 1:30 p.m.

NORTH COUNTY SHADE PLANT CLUB

Pres: Mrs. Druscilla C. Luers 439-3677

1635 Mt. View Avenue

Oceanside, CA 92054

3rd Sat. Ecke Bldg., Quail Gardens

Encinitas, CA 1:00 p.m.



**OHARA SCHOOL OF IKEBANA
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Pres: Mrs. Talmah Gawn 485-0116
13818 Tam O'Shanter Court
Poway, CA 92064

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Pres: Mrs. Walter Bourland 276-4667
2936 Havasupai
San Diego, CA 92117

ORGANIC GARDEN CLUB SAN DIEGO

Pres: Mr. John E. Miller 460-8756
10836 Calle Verde Drive
La Mesa, CA 92041
3rd Fri., every two months starting Jan.
Casa del Prado, 7:30 p.m.

PALOMAR BRANCH

AMERICAN BEGONIA SOCIETY

Pres: Ingeborg Foo (619) 724-4871
1050 Melrose Way, Vista, CA 92083
Quail Botanical Gardens, Ecke Bldg. 2nd Sun.
230 Quail Gardens Dr., Encinitas 2 p.m.

PALOMAR CACTUS AND SUCкулENT SOCIETY

Pres: Mr. Gene Eisenberg 487-1051
17592 Corbel Court, San Diego, CA 92128
4th Sat. Joslyn Senior Center
724 N. Broadway, Escondido 12:45 p.m.

PALOMAR DISTRICT

CALIFORNIA GARDEN CLUBS, INC.

Pres: Mrs. James Valana 421-6504
4112 Country Trails
Bonita, CA 92002

PALOMAR ORCHID SOCIETY

Pres: W.T. Mawhiney 439-9399
1565 Wilshire Road, Fallbrook, 92028
2nd Fri. Vista Senior Citizens Ctr. 7:30 p.m.

POINT LOMA GARDEN CLUB

Pres: Myrna Hines 222-2299
935 Armada Terrace
San Diego, CA 92106
2nd Wed., Sept.-Jun., 3598 Talbot at Canon
Westminster Presbyterian Church, 10 a.m.

**PROFESSIONAL WOMEN'S HORTICULTURE
AND LANDSCAPE ASSOCIATION (PWHLA)**

Pres: Sue McDevitt
Box 3424, San Diego, CA 92103
4th Wed., Jan., Mar., May, Sep
1st Wed., Nov.
Call 759-1545 for further details

QUAIL BOTANICAL GARDENS

FOUNDATION, INC.

Pres: Mr. Richard Poedtkes 758-8332
1709 Montgomery Drive
Vista, CA 92083

RANCHO SANTA FE GARDEN CLUB

Pres: Mr. John Rainsford
Hort. Ch. Corrine Gruenwald
P.O. Box 1696
Rancho Santa Fe, CA 92067
2nd Tues., Rancho Santa Fe Garden Club
Avenida de Acadias, Rancho Santa Fe
7:30 p.m.

SAN CARLOS GARDEN CLUB

Pres: Mrs. B.G. Burke 697-4478
8481 Beaver Lake Drive
San Diego, CA 92119
4th Tues. Home of members, 9:30 a.m.

**SAN DIEGO ASSOCIATION OF
PROFESSIONAL HORTICULTURISTS**

Pres: Charles Olson 222-9476
P.O. Box 34341
San Diego, CA 92103
4th Mon., Casa del Prado Rm 104, 7:30 p.m.

SAN DIEGO BONSAI CLUB INC.

Pres: Mr. Wayne Chapman 755-4451
P.O. Box 40037
San Diego, CA 92104, 11 a.m. Workshop
2nd Sun., Casa del Prado, 1:00 p.m.

SAN DIEGO BOTANICAL GARDEN

Dr. Herbert A. Markowitz 224-8552
876 Armada Terrace
San Diego, CA 92106

SAN DIEGO BROMELIAD SOCIETY

Pres: Pam Keide 438-9393
6523 El Camino Real
Carlsbad, CA 92009
2235 Galahad Rd., Serra Mesa, 7:45 p.m.
1st Thurs. Byzantine Catholic Church

**SAN DIEGO CACTUS AND
SUCкулENT SOCIETY**

Pres: Chuck Adams (619) 530-2551
7305 Rock Canyon Drive, San Diego 92126
2nd Sat. Casa del Prado, 1:30 p.m.

SAN DIEGO CAMELLIA SOCIETY

Pres: Dean Turney 299-8418
631 W. Pennsylvania Ave.
San Diego 92103
3rd Wed., Casa del Prado, 7:30 p.m.

NATIONAL FUCHSIA SOCIETY

Pres: Ted Garrett 753-2665
498 La Costa Avenue
Leucadia, CA 92024
2nd Thurs. Palmquist School

SAN DIEGO COUNTY DAHLIA SOCIETY

1999 California St., Oceanside 7:00 p.m.
Pres: Leslie Pickford 278-1083
5350 Via Bello, San Diego, CA 92111
4th Tues. except Jul & Dec., Casa del Prado

SAN DIEGO COUNTY HERB SOCIETY

Pres: Mrs. Eleanor Kimes 484-3653
13021 Trail Dust Avenue
San Diego, CA 92128
2nd Sat. except Jan, Jul & Aug, 11 a.m.
Homes of Members

SAN DIEGO COUNTY ORCHID SOCIETY

Pres: Genie Hammond 426-6831
1341 Park Drive
Chula Vista, CA 92011
1st Tues., Casa del Prado, 7:30 p.m.

SAN DIEGO DAYTIME

AFRICAN VIOLET SOCIETY

Pres: Beverly Decker 469-9975
7430 Stanford Ave., La Mesa, CA 92041
2nd Mon., Fellowship Hall, Christ United
Methodist Church, 3295 Meade, 12 noon

SAN DIEGO EPIPHYLLUM SOCIETY

Pres: Mr. Milton D. Turner 224-0955
2674 Willow Street
San Diego, CA 92106
2nd Wed., Casa del Prado, 7:30 p.m.

SAN DIEGO FERN SOCIETY

Pres: Bob Halley 272-1019
1714 Malden Street
San Diego, CA 92109
3rd Thurs., Casa del Prado, 7:30 p.m.

**SAN DIEGO FUCHSIA &
SHADE PLANT SOCIETY**

Pres: Mr. Bob Matlock 423-0213
1333 New Chatel Drive
San Diego, CA 92154
2nd Mon., Casa del Prado, 7:30 p.m.

SAN DIEGO GERANIUM SOCIETY

Pres: Mr. Jim Zemcik (714) 551-3264
15442 Orleans Circle
Irvine, CA 92714
2nd Tues., Casa del Prado, 7:30 p.m.

SAN DIEGO GESNERIAD SOCIETY

Pres: Denise Knobloch (619) 268-0610
3915 Argyle
San Diego, CA 92111
3rd Wed. St. David's Parish Hall
5050 Milton St. 7:30 p.m.

**SAN DIEGO/IMPERIAL COUNTIES
IRIS SOCIETY**

Pres: Dorothy Driscoll 463-6700
6338 Lake Athabasca Place
San Diego, CA 92119

SAN DIEGO ROSE SOCIETY

Mrs. Rita Applegate 463-3555
3976 Agua Dulce Blvd.
La Mesa, CA 92041
3rd Mon Oct thru Jun, Casa del Prado

**SAN MIGUEL BRANCH
AMERICAN BEGONIA SOCIETY**

Pres: Mrs. Toni Baker 582-7516
6475 50th Street, San Diego, CA 92120

SOGETSU SCHOOL OF IKEBANA

Pres: Mrs. Leroy Lahey 429-6198
2829 Flax Drive, San Diego, CA 92154

SOUTHWEST GROUP, JUDGES COUNCIL

Pres: Mrs. David W. Hoke 436-9462
335 Avenida de las Rosas
Encinitas, CA 92026

SOUTHWEST HEMEROCALLIS SOCIETY

Pres: Mr. C.R. Bowman 273-7937
3927 Sequoia St., San Diego, CA 92109
1st Sat., Feb., Apr., Jun., Sep., Nov.
10 a.m. Quail Gardens Meeting Room

QUAIL GARDENS RD., ENCINITAS

SUN HARBOR BRANCH

NATIONAL FUCHSIA SOCIETY
Pres: Barney Gonsalves 222-4254
4103 Tennyson St., San Diego, CA 92107
4th Wed. Recreation Hall, Holy Trinity
Church, 2083 Sunset Cliffs Blvd.,
Ocean Beach

THE VILLAGE GARDEN CLUB

OF LA JOLLA

Pres: Dorothy C. Carroll 578-1484
8304 Hydra Lane, San Diego, CA 92126
4th Thurs., Sept. thru May, 1:00 p.m.
La Jolla United Methodist Church
6063 La Jolla Blvd., La Jolla

THE VISTA GARDEN CLUB

Pres: Mrs. Robert Hendenberg 724-5032
4809 Ceanothus Place
Oceanside, CA 92056
1st Fri., at 222 Jefferson St., Vista
Senior Service Center, 12 noon

THE WATER LILY SOCIETY

Pres: Norman Bennett (301) 662-2230
Pres: Charles B. Thomas, Secretary
P.O. Box 104
Buckeystown, MD 21717-0104
Meeting

PROFESSIONAL AFFILIATES

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1928 Madison Avenue
San Diego CA 92116

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Saks Fifth Avenue Courtyard
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La Jolla, CA 92038

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Paul DeMartini 459-0316
P.O. Box 2711
La Jolla, CA 92038

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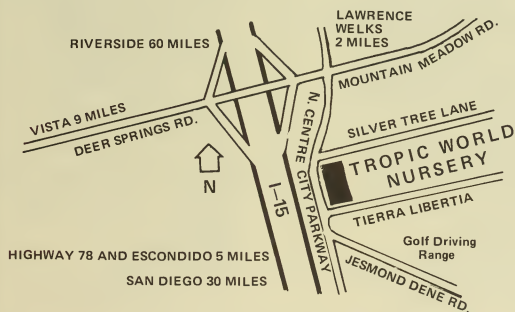
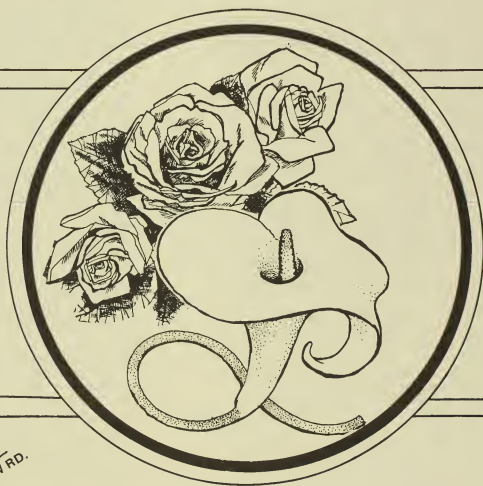
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